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CONFORMAL AUTOMORPHISMS OF A COMPACT BORDERED RIEMANN SURFACE OF GENUS 3

Dedicated to Professor Y. Komatu

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1. Introduction. Let R be a finite Riemann surface of genus g and with k boundary components, and G be the group of all conformal mappings of R onto itself. For given non-negative integers g and k, we put

$$N(g, k)=\max(\mathrm{ord.}\, G)$$

where ord. G means the order of G, and the maximum is taken with respect to all R having the genus g and k boundary components.

For compact surfaces, that is, $k=0$, Hurwitz [5] proved that $N(g, 0)=84(g-1)$. After it many results have been obtained. For special g, the accurate values of $N(g, 0)$ have been known. However, the problem is still open, for infinitely many values of g.

On the other hand, for $k\geqq 1$, Heins [4], Oikawa [9] and the author [11] determined $N(0, k)$, $N(1, k)$ and $N(2, k)$ respectively. And, Kato [6] determined $N(g, k)$ for $k=1, 2, 3$.

In this paper, we shall determine $N(3, k)$ as follows.

THEOREM. *The value of* $N(3, k)$ *is*

168 *for* $84n+0, 24, 56, 80$
96 *for* $48n+0, 12, 32, 44$ *except above cases*
48 *for* $4n$ *except above cases*
24 *for* $24n+2, 6, 14, 18$
16 *for* $24n+10$
14 *for* $14n+1, 3, 7, 9$ *and* $168n+22, 70, 94, 142$
12 *for* $168n+46, 118, 166$
and $84n+5, 13, 19, 25, 27, 39, 41, 53, 55, 61, 67, 75$
9 *for* $252n+11, 47, 81, 83, 95, 117, 131, 153, 165, 167, 201, 237$
8 *for* $504n+33, 179, 249, 251, 321, 467$
6 *for* $504n+69, 215, 285, 431, 501, 503$

2. Method of research. Let $N'(g, k)$ be the order of the largest group of automorphisms of a k-times punctured compact Riemann surface of genus g.

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